

A·C·A·D·E·M·Y
ON
COMPUTERS

Mailed - 21 Feb 1984
Rec'd - 23 Feb 1984

N E W S L E T T E R 2

In this issue...



Computer Clubs: Self-help in the Silicon Age by David Chesanow

Why join a computer club? What can a computer club do for you? Read all about the whys and wherefores of computer clubs beginning on page 2.

Questions and Answers

Our regular column that answers many of the questions we get through the ACADEMY hotline begins on page 4.

Computer-Managed Learning by Cheryl Zimmerman

It is almost time for you to send in your Questionnaire #1. For an explanation of how the ACADEMY will score your questionnaire, read this article on page 7.

Technological Update

What's new and innovative in the world of computers? Our regular column, "Technological Update," is on page 8.

In Print

Peter McWilliams is the author of some of the most entertaining books about computers in print. His books are reviewed on page 8.

Bonus—Computer Programs for You

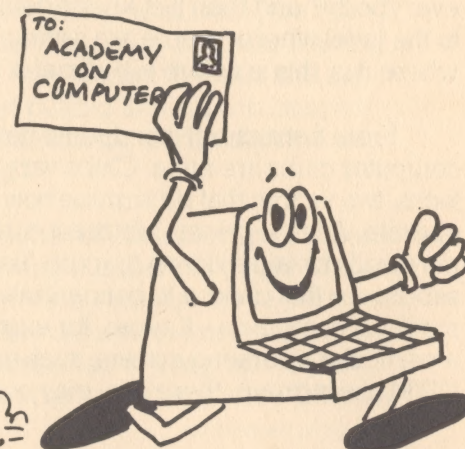
If you have a mortgage or are thinking of getting a mortgage for your home, the computer programs starting on page 10 will figure your payments. In this issue the program is provided for the Commodore Pet, Commodore 64K, TRS-80 and Apple computers. Newsletter #3 will contain the same mortgage program for the Atari, Texas Instruments and Apple computers.

Over 13000 Participants in the ACADEMY ON COMPUTERS!

The 13000 people enrolled in the ACADEMY ON COMPUTERS represent a wide range of professions and special interests—from doctors, lawyers and educators to clergymen and parents of small children. The ACADEMY enrollees are using a variety of computers to work through the course. The breakdown of our participants by computer is as follows:

Apple II Plus	29%
Atari 400 or 800	5%
Commodore Pet	2%
Commodore 64K	15%
IBM PC	27%
TRS-80 Model III/disk	5%
TRS-80 Model III/cassette	2%
Texas Instruments 99/4A	10%
Unknown	5%

You may want to tell your friends and relatives that they haven't missed out on the opportunity to participate in the ACADEMY ON COMPUTERS. The ACADEMY will be repeated beginning in April, to be offered by forty public television stations across the country. Check your local station for the start date.



Computer Clubs: Self-help in the Silicon Age

by David Chesanow

What are computer clubs? Perhaps your last recollection of a club was a group of students with a particular goal who met after class in order to realize that goal, whether it was tutoring other students, publishing a literary magazine, or playing a better game of backgammon. Computer clubs form for precisely the same reason: to pursue a shared objective. However, unlike clubs in which all members are from the same high school or church group or are employees of the same corporation, computer club memberships are often much more heterogeneous. Perfect strangers—men and women of all ages and backgrounds—are banding together in growing numbers in order to share news and advice—and their hard-won experience—with other users.

Sound a little like computer group therapy? Well, it is. But no matter what you think of modern psychology, the problems discussed at club meetings are ones that either everyone has now or had at one time, at which point the veterans explain the solutions. Consider the possible situations: A young artist is not trying to analyze her problems with her mother; she wants to know how to hook up her printer. A middle-aged salesman desires, not to rid himself of a feeling of professional failure, but to debug a new program for doing income taxes. The problems and discoveries that come up are ones that everyone will want to explore, regardless of experience. Solveig Overby, a lawyer and the membership chairperson of the Vermont-New Hampshire Osborne Users Group, explains how someone with a specific area of expertise or who has discovered something of interest may address the group: "We assume zero knowledge. The person who is making the presentation is told to start from zero, and then you find at a certain point people will recognize where they can cut in... It's constantly: 'Well, does this make sense or am I below everybody?' and then just keeps going until you get to the level where people are saying, 'Yeah, this is where it is, this is where we all get it.'"

From a structural standpoint, however, not all computer clubs are alike. Clubs vary in size and focus, two factors that determine how the club will operate. A large general-interest computer club may well contain a dozen or more "users groups," subgroups that choose to concentrate on a single model of computer—Kaypro, for example—or on a particular operating system, such as CP/M. (A CP/M users group, therefore, may contain Kaypro,

Osborne, and DEC users). The designation *users group*, however, does not necessarily mean that the group is affiliated with a larger association.

Despite organizational differences, computer clubs do share a principal objective: to educate and to disseminate information among their members. Does this mean that the clubs are substitutes for instruction in personal computing? Gail Collins, an application programmer and president of the CP/M Houston Users Group, says, "You probably have to know a little bit about your computer before you'll benefit from a users group." You can feel confident that the ACADEMY ON COMPUTERS equips you with enough knowledge to join a computer club.

But doesn't the beginner get lost among the more experienced members of a club? Not really. The larger and more diverse the club, the more inevitable the formation of special-interest groups, or SIGs, within that club. SIGs are a way that computer clubs enable their members to satisfy special needs and interests. Most clubs have beginners SIGs, where new computer users get special attention and can ask the most fundamental questions without taking up time at the general club meeting. In other words computer clubs, unable to go over old ground each month for reasons of time and patience (there may be an influx of new beginners at each successive meeting), employ beginners SIGs as a means to acclimate the beginner to the level of general club discussion. Meanwhile, any number of other, more advanced SIGs within the same club may preoccupy themselves with just as many different projects, from writing one kind of program to debugging another. Since a CP/M users group, for example, may not restrict itself to working with one computer but with any number of CP/M systems, the result may be a corresponding number of SIGs (as each computer has its own special potentials and peculiarities). Thus, each SIG can address the specific needs and interests of its members, independent of the other SIGs. Membership in more than one SIG, like membership in more than one users group, is perfectly acceptable.

While an introductory course in computers is by no means a prerequisite for joining a computer club—even one with a high percentage of "old-timers"—individual initiative outside the framework of the group is essential. However, there are always extremes built into a club's membership (no two

members ever have the same level of user knowledge), so the club's planning committee must create common ground—strike a balance by providing interesting projects and presentations that all club members can enjoy and benefit from, regardless of experience. This common ground almost always includes a burgeoning library of public-domain software, as well as guest speakers, a club newsletter, and often a bulletin board (the electric kind), and may feature special workshops (the CP/M Houston Users Group held one in which the participants built print buffers) and a hardware buying service to refer members to dealers with whom the club has arranged discounts.

In computer clubs and users groups, then, there is a place for everyone. Gail Collins' Houston-based CP/M users group has about six hundred members, with some two hundred—at least half of them beginners—in attendance at regular meetings. Ms. Collins remarks: "With such a large group we have to try to break down the barriers and not leave anybody out in the cold; but as these new people come along there's a lot of raw talent, and as they progress...they are eager to pass on some of their knowledge [to new arrivals]."

In a club such as the New York Personal Computer, Inc., an IBM PC users group, the majority of the members are already beyond a certain level of computer knowledge, since the investment in an IBM PC usually indicates above-average seriousness; purchasers often intend to use the computers in their businesses or for research purposes. Dr. Eric Jaffe, a hematologist at Cornell University Medical College and president of New York Personal Computer, while encouraging rank beginners to attend his club's meetings, nonetheless urges them just to observe general meetings until they know enough to be able to contribute to the open discussion. It's by keeping one's eyes and ears open at group meetings and obtaining hands-on experience on one's own that an individual may equip him- or herself to branch off in a particular direction and become proficient in that area. In time, Dr. Jaffe says, "you may really know something at one level, and somebody may know something about something else that you want to know about, so you [can] feed each other."

But you don't even have to have purchased a computer to be welcome at a computer club. Clubs encourage people to attend if they are still trying to determine which system is right for them. Gail Collins recommends that prospective buyers attend a club for two to three months prior to making a purchase, so that they know what to expect from their computers as well as what dealer support they will receive after purchase.

Does this mean that computer clubs are consumer-oriented? The answer is yes. The clubs are composed of people who have made the same or similar expenditures and want to help one another get the most out of their investments. For example, if a program has a lot of bugs in it, a users group may address its grievance to the manufacturer and seek recourse, such as an updated version of the program. Charles Honce, an actor and former president of the Manhattan 64 users group, explains that the Commodore 64 is "a hell of a machine." But, Mr. Honce continues, Commodore "has this record of coming out with new machines that are totally incompatible with the previous machines," a fact that the prospective Commodore purchaser would soon learn if he attended the group's meetings. "Don't buy anything [yet]," Mr. Honce urges those in the shopping-around stage. "Come to a meeting. Talk to the people: Find out what they're doing, what problems they've had, what they can do, what they're into, and I think a lot more intelligent decision can be made on that basis."

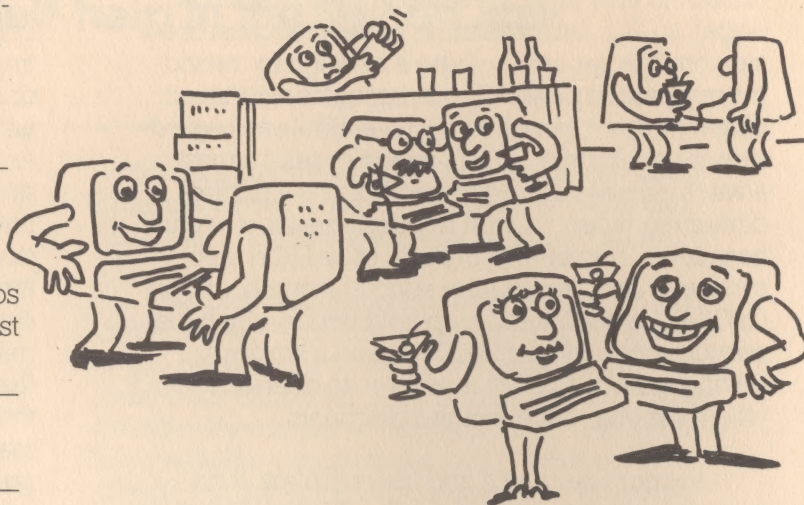
If all of this convinces you that membership in one or more clubs or users groups is as vital as hearing the world news each day, there are a number of ways to find out which ones are located in your area. Ask at the store or stores that you're investigating or where you bought your system already; they should be able to steer you in the right direction. Check the computer section of the classifieds. If you already own a microcomputer, you might check computer bulletin boards; if not, check out the cork bulletin boards on campus or in public places, like libraries, grocery stores, and self-service laundries. If you are unable to locate a computer club nearby, or are not satisfied with what the clubs already in your area have to offer, have no compunctions about starting your own organization. Charles Honce founded his users group. When he called Commodore, after purchasing his 64, and asked if there was a Commodore users group in Manhattan, "they said no and I said 'Yes you do,' and that's how it got started. ...[Commodore] has a magazine and I told them I was starting a users group; and I told [the store] where I bought the computer that I was starting a users group, and they lauded the idea and supported it. I started putting little ads on bulletin boards at various computer stores, saying I was starting the group."

Computer clubs reflect a new social interaction among a growing number of people who are enthusiastically entering the age of the personal computer. Such associations are not made up of those who feel compelled to keep up with the Joneses by buying personal computers, then run

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into problems and are content to allow their investments to gather dust. Rather, the clubs are formed by people who are reaching the same impasses, running into the same brick walls—"people who are having trouble inventing the same wheel that you're trying to invent," according to Gail Collins—and are pooling their knowledge in order to help one another to overcome these obstacles. How far can they take it? That's anyone's guess. One thing does seem certain: What motivates computer clubs heralds a society of micro-users who will be not just computer-literate but computer-eloquent.

David Chesanow is a free-lance editor who has contributed to a variety of publications about computers.



We Get Questions...

And we do our best to provide answers through our special ACADEMY *hot lines* and in this column, a regular Newsletter feature. Here we'll respond to a selection of the general issues raised most frequently by those ACADEMY participants who have contacted their stations through letters or *hot line* calls.

Q: What is CP/M?

A: CP/M stands for "Control Program for Microcomputers." It is *not* a computer language; rather, it is a disk operating system (DOS)—which, as you may recall from chapter 4 of the *Academy on Computers Resource Book*, is the system that performs all the routine internal operations required to carry out a single command. Another way of looking at DOS is to see it as the interface between the computer hardware and any software application program.

CP/M will run on more different models of microcomputers than will any other DOS, making it the standard microcomputer operating system. Manufacturers make their machines run CP/M to maximize software compatibility; conversely, new programs are made compatible with CP/M to ensure the widest possible market.

There are four basic parts to the CP/M operating system. The

BIOS (basic input/output system) lets the computer reach the disk drives, and communicate with printer, modem, and other peripherals. The BDOS (basic disk operating system) manages the floppy disks, using the information directories or formats stored on them. The CCP (console command processor) translates your keyboard input into data and commands. The TPA (transient program area) holds specific applications programs—a word-processing program, for instance.

While CP/M is not a language, it does include a number of commands that you need to know, because few applications programs will isolate you from CP/M completely. *Resident* commands are the most commonly used; they include ERA (erase), DIR (directory), REN (rename), SAVE (store memory contents), and TYPE (display a text file). Unlike resident commands, which are loaded once and remain in the memory, *transient* commands must be loaded each time you use them. They include STAT (status—how much space remains on a disk) and PIP (peripheral interchange

program—transfer a file from one drive to another, or print a file).

For more information on CP/M, look for two manuals published by Digital Research Corporation, the company that developed and markets the system: *An Introduction to CP/M Features and Facilities* and *The CP/M 2.0 User's Guide*. Also, locate these articles in *Popular Computing* magazine: "Disk Operating Systems" (March 1982) and "The CP/M Operating System" (February 1983). CP/M, it seems, is here to stay, though Digital Research is constantly adding functions and features to keep the system attractive, flexible, and competitive.

Remember: while CP/M runs on many personal computers and a large number of business computers (and much other hardware can be modified to run CP/M), it's not true that every computer that runs CP/M can accommodate *all* CP/M software. There are almost a dozen different standards of disk size and format, and few of them are compatible with one another.

Q: I use audio cassettes to store program and data files for my personal computer. Is this wise? Are there practical procedures that I should follow?

A: Many participants have asked such questions, perhaps because so much has been said about the limitations of cassette storage as opposed to disk storage. The first and most obvious limitation is that cassettes can only be accessed sequentially, rather than randomly, as are disks. Beyond this, cassettes are more susceptible to breakdown, to physical damage that renders the information on them unreadable, and to accidental erasure. However, many people opt for a cassette-based storage-and-retrieval system, for the very good reason that it's much cheaper.

If you've decided to go with cassette tapes, there are some simple procedures that will minimize potential problems.

1. Use a cassette recorder made or supplied by the computer manufacturer or retailer. Your recorder should have a tape counter, a volume control that's easy to set and read, and an AC (house current) power supply.
2. Use high-quality tape, since computer applications require tolerances much finer than those for recording speech or music. Low-noise, high-output tape (not chrome or ferrichrome) is best. Once you've found the brand that gives best results, stick with it.
3. Never use the first or last few minutes of the cassette, since these are where tape stress and fault are more likely to occur.
4. Take care in setting the volume control, especially for playback. Experiment until you find the setting that consistently produces a good save/verify sequence, then note or mark that level and use it every time you load a program.

5. Keep a careful written log of what is on each portion of each cassette, including file name or description, date of file creation, and the tape counter numbers at the beginning and end of that file. This will make it easier to locate a particular file and will help you avoid erasing or recording over existing material.

6. For your logging system to work accurately, it is essential that you fully rewind the tape and reset the tape counter to zero every time you insert a cassette. Once the counter is set, don't touch it again until you put in a new tape; then, rewind and reset again.

7. Always check the tape before executing a "save." Rewind the tape, reset the counter, disconnect the recorder, and run the tape ahead to the point where you intend to record. If you don't hear anything, you're on blank tape and you can save your next program at that spot.

8. Never try to insert a new file into the middle of an already-recorded tape. Go to the point on the tape where your log indicates the end of the last file, check it as indicated above, then record the new file so that it begins shortly after the previous one ends. Old tapes should only be re-used if they have been completely erased.



Q: I'm interested in using a computer to control home functions such as heating, lighting, and security. What advice can you give me?

A: The so-called "wired household" is already a reality for anyone who wants and can afford it. Basically, the computer takes your place, pushing buttons on a variety of individual devices or on a cordless remote-control device that activates several home functions.

Compu-Home Systems of Denver, Colorado, markets "Tomorrow House," a combination of hardware and software designed to run home appliances, monitor energy consumption, and control alarms. The system uses a modified Apple II Plus computer, and comes in two versions: a kit that handy Apple owners can install in about 18 hours for around \$700; and a fully-installed system—including the computer—for around \$5000. In addition to household functions, Tomorrow House has a memo-reminder capability, and can be programmed to balance financial accounts, address Christmas cards, and so on.

There are drawbacks to any such system, though, and you should be aware of them. For one thing, a considerable amount of outboard equipment is required, and you may have to rewire your house substantially! Also, your micro will likely have to be "dedicated" to this particular function: that is, you won't be able to turn it off or use it for other applications.

Many people, therefore, prefer a "modular" approach, using small, inexpensive programmable units attached to specific systems. For instance, you can buy a computerized thermostat to control your furnace and air conditioner. Most home entertainment systems can be equipped with timers.

(continued on next page)

The computer "tinkerer" will find developing customized home computer control systems to be challenging and rewarding, and should scan computer books and magazines for ideas.

Q: Will we ever get intelligent computers?

A: The answer to this question, which continues to preoccupy researchers on the cutting edge of cybernetic research, ultimately depends on what we think of as intelligence. Ira Goldstein, a scientist with Hewlett-Packard in California, believes that "any biochemical process going on in your head is duplicable as electrons flowing on silicon." For those who share this view, the challenge is to design and build a computer that can perform as many discrete operations as the human brain. The coming generation of computers, processing information perhaps 200 times as fast as today's best models, will bring us closer to that goal.

On the other hand, some people remain convinced that the difference between the computer and the brain is qualitative, and not just quantitative.

As Hubert Dreyfus, a philosopher at the University of California, puts it: "These machines always just apply a whole bunch of rules to a whole bunch of facts. That's not intelligence; it's a sort of fancy calculating device." The question then becomes whether computers can acquire the equivalent of other aspects of human consciousness besides pure logic—things like intuition and ambiguity, the ability to reason from analogy and learn from experience. And can computers acquire the elusive, but all-important, ingredient we call common sense: the ability to break the rules creatively when the problem or the situation demands?

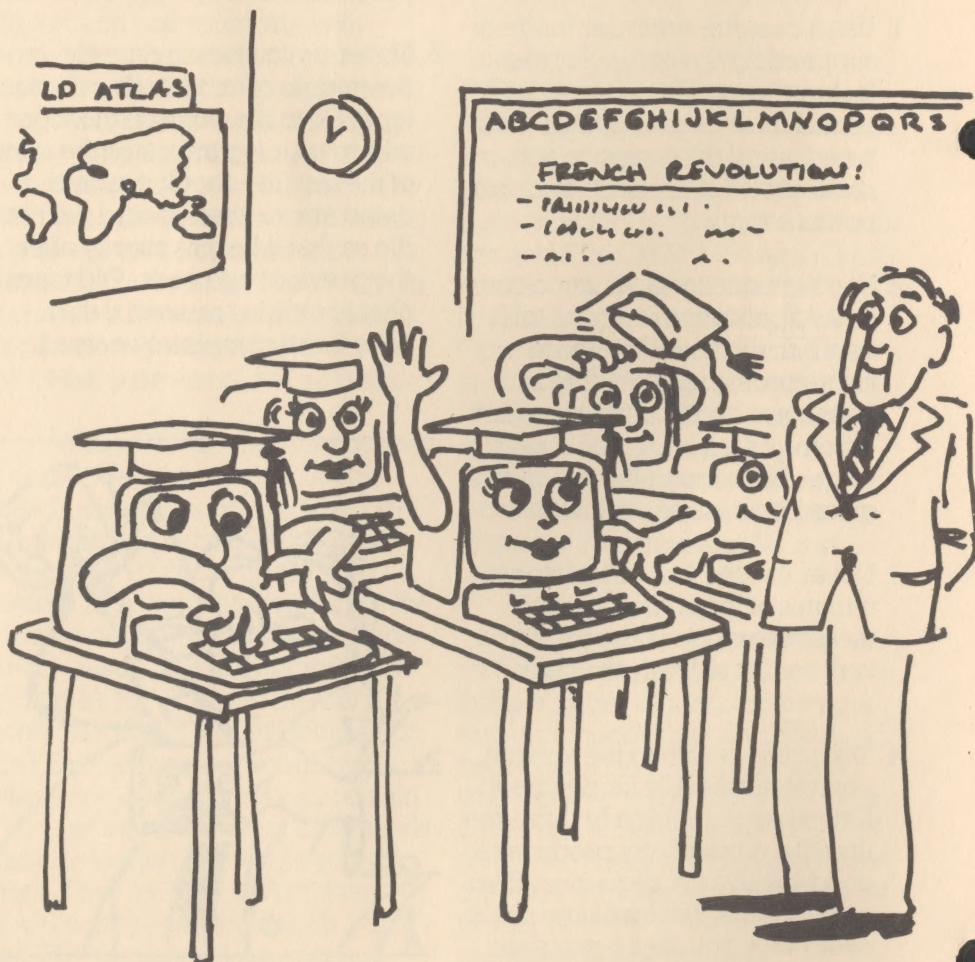
Those who believe in the possibility of what's come to be known

as "artificial intelligence" argue that everything a human being knows is the sum of what he or she has learned over a lifetime, and if a human can acquire these things, so can a computer. But no computer yet built, or even designed, can do so well what men and women do every day: generate knowledge, or make significant connections between one area of knowledge and another.

While philosophers continue to debate the issue, considerable strides are being made in such areas as robotics, machine vision, speech recognition and generation, all of which are key ingredients to any future "artificial intelligence" machine. The greatest success to date has been in the sort of computer program known as an "expert system." Such a program has so sophisticated a grasp of a single field of knowledge that it can not only solve problems but actually

replicate human thought processes: posing questions, analyzing relevant cases, making connections between seemingly disparate facts, even using such "human" devices as inference, rules-of-thumb, and educated guesses or hunches to reach conclusions. Expert systems have been developed to help discover mineral deposits, diagnose and treat illnesses, prepare legal arguments, translate texts, and write computer programs for other systems.

There's no question that computers are getting "smarter"; whether they'll ever become intelligent in a human way is something we'll likely find out in the next two decades. Interested in learning more? One good book is *Artificial Intelligence* by Patrick H. Winston of MIT. Check out your local library for other books and articles on this subject.



Computer-Managed Learning

By Cheryl Zimmerman

ACADEMY ON COMPUTERS is using a computer-managed learning (CML) system to process participants' answers to the two questionnaires and generate individualized response letters. CML is a powerful educational tool, as Cheryl Zimmerman explains.

Computer-managed learning is the use of computers to help accomplish management aspects of teaching and learning. In CML, the actual learning takes place away from the computer; the computer is used to score tests, interpret results, and manage student records and administrative information. CML can also assist teachers in maintaining individualized communication with students by letter. A well-designed system allows a teacher to input the information, define the basis for its individualization, and describe the relevant characteristics of the students who will receive it.

A teacher would individualize instruction to create a personal teaching/learning environment for each student, no matter how large the class, or—in the case of distance learning—where the student is located; provide appropriate feedback to reinforce or correct the student's understanding; and provide guidance throughout the program of instruction. It is the teacher's responsibility to decide the basis for individualizing instruction. Factors here include students' levels of understanding, reading levels, courses they have taken, and so on.

The content of individualized communication rests with the teacher, whose unique teaching qualities can be reflected in the information that he or she communicates by means of the CML system. For a teacher to achieve the goals of individualized instruction, a CML system should perform these functions:

1. maintain a student database. This would encompass students' personal characteristics (name, age, employment) and environmental characteristics (class section, enrollment date, proximity to learning resource center).
2. process students' answers to objective tests and teacher-evaluated assignments. Assessment methods vary in CML systems, but the most common is the multiple-choice format.
3. select and print appropriate feedback, instruction, advice, reinforcement, and/or assignments in the form of a letter to each student.

CML can help evaluate the teaching/learning environment by generating reports and rosters. These could list students and their activity scores, summarize students' answers and the kinds of feedback received, and analyze the questions asked. CML helps the teacher keep track of each student's standing and progress.

A CML system, then, can relieve teachers of much that is burdensome and time-consuming. However, to be an effective educational tool, it requires a teacher's extensive intellectual work prior to implementation. The teacher must set down clear educational goals for each activity, and then design appropriate assessment procedures and feedback letters to accomplish them.

Cheryl Zimmerman is a librarian for TVOntario in Toronto, Canada.

Questionnaire Mailing Schedule

The Correspondence Envelope contains two questionnaires, two answer sheets, and two business reply envelopes. The questionnaires are designed to test your understanding of the ideas and information presented in the "Bits and Bytes" programs and the ACADEMY ON COMPUTERS RESOURCE BOOK. In order for us to respond quickly to your questionnaires, we ask that you comply with the following schedule for submitting your answer sheets.

WEEK OF FEBRUARY 26, 1984 (following program 6)—

Complete Questionnaire #1 and return Answer Sheet #1 in the business reply envelope provided for your convenience postmarked no later than *Sunday, March 11, 1984*.

WEEK OF APRIL 8, 1984 (following program 12)—

Complete Questionnaire #2 and return Answer Sheet #2 in the business reply envelope provided for your convenience postmarked no later than *Sunday, April 22, 1984*.

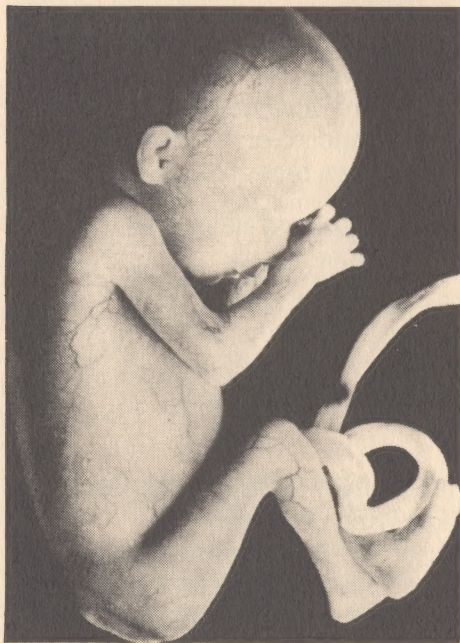
Responses will be sent to you within two weeks of the receipt of your answer sheets.

Certificates of Completion will be sent to all participants who complete both questionnaires.

REMEMBER—Please remember to write your *Registration Number* on the top of Answer Sheet #1 and Answer Sheet #2. Thank you.



Technological Update



Soporific Software

A new British invention uses a silicon chip to lull users to sleep by simulating the sound heard in a mother's womb before birth. "Sleepy" was developed to comfort newborn babies, but doctors found it worked well on adult insomniacs too. Small enough to tuck under a pillow, it makes a sound not unlike waves lapping on a beach, and switches itself off automatically after 20 minutes. We haven't learned where to get one yet, but it sounds like just the thing after a heavy day at the computer.

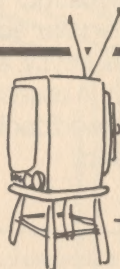
Royal College of Physicians and Surgeons, London, England.

For Writers—by Word of Mouth

Wordsmiths who use computers can subscribe to *WP News: Writer's POV on Word Processing*. This bimonthly interviews authors using word processors, and highlights hardware, software, and events of interest to writers. A year's subscription costs \$20. Write to Word of Mouth Enterprises, 1765 North Highland, No. 306, Hollywood, California 90028

Slenderized Monitor

The next step in computer portability and compactness may be the replacement of the cathode-ray tube monitor (basically the television picture tube) with slim, flat, notebook-sized displays that use the light-emitting diodes and liquid-crystal displays used in digital watches and pocket calculators. As yet, the trim-sized display units offer only about half-a-page in one color and cost up to ten times as much as a conventional CRT. But their promoters anticipate mass-market penetration in the \$100-and-up range by the end of this decade.



In Print

Time magazine calls Peter McWilliams' book, *The Personal Computer Book*, "a beacon of simplicity, sanity and humor. The fastest-selling computer guide on the market." The book is full of practical information on databanks, programs and programming, computer games, computers in education, etc. There's even a section on how to purchase a microcomputer, including evaluations of various makes and models of computer and a list of common buyer mistakes. What makes this book so outstanding is Mr. McWilliams' use of pictures and humor to present a difficult subject in an entertaining and informative style.

By the way, if you want to know more about word processing, you will learn a lot from Peter McWilliams' *The Word Processing Book: A Short Course in Computer Literacy*. And now there is an equally witty and enlightening book from the same author for business people, *The Personal Computer in Business Book*. All three of the McWilliams books are highly recommended. They are available in most bookstores and are published by Prelude Press, Box 69773, Los Angeles, California 90069.



Festival on Public Television

Public television stations celebrate Festival at the beginning of March. During this period of 1-2 weeks, program schedules may vary. Please check your local station listing to see if "Bits and Bytes" has been rescheduled during Festival.

Databases

As you have learned, it is possible for your computer to communicate or talk to other computers of all sizes (Program 5, Communication Between Computers). All you need is a modem, a device which allows you to connect your computer to other computers through your phone line. Now you can tie into the world of databases. A database is a vast storehouse of information which resides on a main-frame computer. Today thousands of these databases covering a wide variety of subjects are commercially available. The topics covered by databases range from the most up-to-date information about corporations, stock market data, legal, scientific and technical information, to news of the advertising business, the record industry and horse breeding. To gain access to these databases (you pay an hourly fee in most cases), all you need is your computer, a telephone and a modem and you can enter a whole new area of computing! The Source and CompuServe, two database networks, are profiled here.

The Source

1616 Anderson Rd
McLean, VA 22102
(703) 734-7500

Hours: 22 hrs. daily

Minimum/Month: \$10.00

Initial Fees: \$100.00

Rates: \$7.75-\$20.75/hr.

Description: The Source offers more than 800 databases in the following categories: communications, business news and services, education and careers, government and politics, home and leisure, news and sports, science, technology, travel, dining and entertainment, user publishing, user programming and Source Plus.

CompuServe

5000 Arlington Centre Blvd.
Columbus, OH 43220
(614) 457-8600

Hours: 24 hrs. daily

Minimum/Month: N/A

Initial Fees: None

Rates: \$5-\$22.00/hr.

Description: CompuServe provides hundreds of databases in four major categories: home services, business and financial, personal computing, and services for professionals. The database offerings are updated and increased continuously as new services are added.

Corrections...

The front page of the ACADEMY ON COMPUTERS Newsletter #1 outlined the 12 week course schedule. The fourth column, headed "... Then Compute," lists chapters 1-7 in the Hands-On Manuals to be completed during the course. As you undoubtedly noticed, the Hands-On Manuals are not organized in chapters, but rather by units. Therefore:

- Chapter 1 = Before You Begin
- Chapter 2 = Unit I: How Do You Start?
- Chapter 3 = Unit II: How to Use Ready-Made Programs
- Chapter 4 = Unit III: Programming—Who Me?
- Chapter 5 = Unit IV: Programming in BASIC (1)
- Chapter 6 = Unit V: Programming in BASIC (2)
- Chapter 7 = Unit VI: How to Modify a Program

"Hands-On IBM PC:
A Beginners' Manual"
On page 34 under the heading
REVIEW is a short computer program.
Line 80 should read:
80 goto 110



The ACADEMY ON COMPUTERS NEWSLETTER is published by:
WNET/THIRTEEN
New York, New York

ACADEMY NEWSLETTER:

Editor: Peggy Yalman

Publications Supervisor: Melinda Klaber

Designer: Juanita Gordon

Illustrator: Jowill Woodman

TVOntario acknowledgements: Editor: Elizabeth MacLean; Contributors: Judy Winestone, Deborah Levy, Ian Alexander; Designers: Danny Leung, Roswita Busskamp

Mortgage Program

The ACADEMY ON COMPUTERS is pleased to provide you with a computer program to figure your mortgage payments. And even if you don't have a mortgage, typing a program into your computer is a useful "hands-on" exercise. Programs like this can be found in dozens of magazines and newsletters. Since you must enter them yourself, they are a valuable and inexpensive form of software. In this issue we are providing versions for the Apple II Plus, TRS-80 and Commodore PET and 64 computers. In the next issue of the newsletter, we will provide versions for the Atari 400 and 800, IBM PC and Texas Instruments 99/4A.

For the Apple II Plus

LIST

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100 REM *****
110 REM *****
120 REM
130 REM      MORTGAGE
140 REM      DW CHANTRY
150 REM      TVD
160 REM
170 REM *****
180 REM *****
190 REM
200 REM C = COMPOUNDS/YEAR
210 REM IR = INTEREST RATE
220 REM IX = INTEREST FACTOR
230 REM P = PRINCIPLE
240 REM PY = PAYMENT
250 REM T = TIME
260 REM YA = CURRENT YEAR
270 REM MA = CURRENT MONTH
280 REM Z1 & Z1$ ARE VARIABLES
290 REM USED FOR SCREEN
300 REM FORMATTING
310 REM
320 REM
330 REM
340 REM
1000 REM *****
1010 REM MAIN PROGRAM
1020 REM *****
1030 REM
1040 REM
1050 TEXT : HOME
1060 REM SET UP HEADING
1070 GOSUB 2080: GOSUB 2090: GOSUB
2090: GOSUB 2090: GOSUB 2080

1080 PRINT
1090 PRINT : PRINT "PRINCIPLE";:
HTAB 20: INPUT "":P
1100 PRINT : PRINT "RATE %P.A.";
: HTAB 20: INPUT "":IR
1110 PRINT : PRINT "2 COMPOUNDIN
GS/YEAR? N/-": PRINT "RESPON
D WITH <CR> IF 2 ":C = 2:
GET X$: IF X$ < > "N" THEN
GOTO 1130
1120 PRINT : INPUT "THEN HOW MAN
Y COMPOUNDINGS/YEAR ?":C: GOTO
1140
1130 PRINT C
1140 PRINT : PRINT "TIME-YEARS":
PRINT "(AMORTIZATION)": HTAB
20: INPUT "":T
1150 REM CALCULATE INTEREST FAC
TOR
1160 IR = IR / 100: GOSUB 3080
1170 REM CALCULATE MONTHLY PAYM
ENT
1180 GOSUB 3070
1190 REM NOW FIX 2 DECIMAL PLAC

ES
1200 Z1 = PY: GOSUB 6100:PY = Z1:
PZ = Z2
1210 HOME
1220 REM CALCULATE MONTH BY MO
NTH
1230 GOSUB 4070
1240 HOME : VTAB 10: PRINT "DO A
NOTHER MORTGAGE? N/- ": GET
X$: IF X$ = "N" THEN GOTO 1
260
1250 CLEAR : GOTO 1050
1260 HOME : VTAB 10: PRINT "ALLR
IGHT THEN ....": FLASH : PRINT
" GOOD-BYE ": NORMAL : FOR P
A = 1 TO 2000: NEXT : TEXT :
HOME
2000 END
2010 REM
2020 REM
2030 REM *****
2040 REM HEADING
2050 REM *****
2060 REM
2070 REM
2080 FOR X = 1 TO 40: PRINT "*";
: NEXT : RETURN
2090 PRINT "***" TAB( 39)"***": RETURN

2100 PRINT : PRINT "YEAR MONTH I
NTEREST PRINCIPLE BALANCE"
2110 PRINT "-----"
2120 RETURN
2130 PRINT "PRINCIPLE $";P; TAB(
23)"IX ";IX
2140 PRINT T;" YEARS @ ";IR * 10
0;" % IS $";:Z1 = PY: GOSUB
6100: PRINT LEFT$ (Z1$,J +
2);" PER MONTH"
2150 RETURN
3000 REM
3010 REM
3020 REM *****
3030 REM FORMULAE
3040 REM *****
3050 REM
3060 REM
3070 PY = (P * IX) / (1 - (1 + IX
)^ (- 12 * T)): RETURN
3080 IX = ((1 + IR / C) ^ (C / 12
) - 1): RETURN
4000 REM
4010 REM
4020 REM *****
4030 REM MONTH BY MONTH
4040 REM *****
4050 REM
4060 REM
4070 YA = 0:MA = 0:BA = P
4080 FOR YA = 1 TO (T): GOSUB 40
90: NEXT : RETURN

4090 GOSUB 2080: GOSUB 2130: GOSUB
2080: GOSUB 2100: FOR MA = 1
TO 12: GOSUB 5070: NEXT
4100 PRINT : PRINT "CONTINUE LIS
TING TO END OF ";T;" YEAR(S)
?. N/-": PRINT CHR$ (8);: GET
X$: IF X$ = "N" THEN GOTO 1
240
4110 HOME : RETURN
5000 REM
5010 REM
5020 REM *****
5030 REM MORTGAGE ARITHMETIC
5040 REM *****
5050 REM
5060 REM
5070 IA = BA * IX:PA = PY - IA:BA
= BA - PA
5080 Z1 = YA:X = 4: GOSUB 5150
5090 Z1 = MA:X = 9: GOSUB 5150
5100 Z1 = IA:X = 18: GOSUB 5160
5110 Z1 = PA:X = 26: GOSUB 5160
5120 Z1 = BA:X = 37: GOSUB 5160
5130 PRINT
5140 RETURN
5150 GOSUB 6130: PRINT TAB( X -
(K)) LEFT$ (Z1$,K);: RETURN

5160 GOSUB 6100: PRINT TAB( X -
(J)) LEFT$ (Z1$,J + 2);: RETURN

6000 REM
6010 REM
6020 REM *****
6030 REM 2 DECIMAL POINTS
6040 REM *****
6050 REM
6060 REM LINES UP NUMBERS SO
6070 REM DECIMAL POINTS IN
6080 REM SAME COLUMN
6090 REM
6100 Z1$ = STR$ ((Z1) + .005): FOR
J = 1 TO LEN (Z1$): IF MID$
(Z1$,J,1) < > "." THEN NEXT
J
6110 IF J + 2 > = LEN (Z1$) THEN
Z1 = Z1 + .001:Z1$ = STR$ (
Z1)
6120 RETURN
6130 Z1$ = STR$ (Z1):K = LEN (Z
1$): RETURN

```


For the TRS-80 Model III

```

10 REM MORTGAGE by DW CHANTRY, TVO
20 REM C = COMPOUNDS/YEAR
30 REM IR = INTEREST RATE
40 REM IX = INTEREST FACTOR
50 REM P = PRINCIPAL
60 REM PY = PAYMENT
70 REM T = TIME
80 REM YA = CURRENT YEAR
90 REM MA = CURRENT MONTH
100 REM MAIN PROGRAM
110 CLS
120 REM SET UP HEADING
130 GOSUB 340:GOSUB 350:GOSUB350:GOSUB350:GOSUB340
140 PRINT@86,"TVO MORTGAGE PROGRAM";PRINT@154,"BY DW CHANTRY";PRINT@206,"Modified for TRS-80 by JF LIVINGSTON";
150 PRINT@384,"PRINCIPAL";TAB(23):INPUTP
160 PRINT"RATE %P.A.";TAB(23):INPUTIR
170 PRINT"2 COMPOUNDINGS/YEAR? N/- ";C=2
180 GOSUB610:PRINTX$:IFX$(<)"N"THENGOTO200
190 INPUT"THEN HOW MANY COMPOUNDINGS/YEAR ";C:GOTO210
200 PRINT
210 PRINT"TIME-YEARS";TAB(23):INPUTT
220 REM CALCULATE INTEREST FACTOR
230 IR=IR/100:GOSUB440
240 REM CALCULATE MONTHLY PAYMENT
250 GOSUB430
260 CLS
270 REM CALCULATE MONTH BY MONTH
280 GOSUB460
290 CLS:PRINT@403,"DO ANOTHER MORTGAGE? N/- ";
300 GOSUB610:PRINTX$:IFX$="N"THENGOTO320
310 CLEAR:GOTO110
320 CLS:PRINT@403,"ALLRIGHT THEN..... GOODBYE ":FORPA=1TO2000:NEXT:CLS
330 REM HEADING
340 FORX=1TO64:PRINT"*";:NEXT:RETURN
350 PRINT"***TAB(62)"**";:RETURN
360 PRINT@0," YEAR MONTH INTEREST PRINCIPAL BALANCE"
370 PRINT " ---- -"
380 RETURN
390 PRINT"PRINCIPAL ";USING"###,####.##";P;:PRINTTAB(30)"INTEREST FACTOR =" ;IX
400 PRINT T;"YEARS @";IR@100,"% IS - ";USING"###,###.## PER MONTH";PY
410 RETURN
420 REM FORMULAE
430 PY=(P*IX)/(1-(1+IX)[(-12*T)):RETURN
440 IX=((1+IR/C)[(C/12)-1]):RETURN
450 REM MONTH BY MONTH
460 YA=0:MA=0:BA=P
470 PRINT@320,"":GOSUB340:GOSUB390:GOSUB340:PRINT@970,"(< PRESS ENTER TO CONTINUE >";:GOSUB610:CLS:FORYA=1TO(T):GOSUB480:NEXT:RETURN
480 GOSUB360:FORMA=1TO12:GOSUB530:NEXT
490 PRINT:PRINT"CONTINUE LISTING TO END OF ";T;" YEAR(S)?. N/-";
500 GOSUB610:PRINTX$:IFX$="N"THENGOTO290
510 CLS:RETURN
520 REM MORTGAGE ARITHMETIC
530 IA =BA*IX:PA=PY-IA:BA=BA-PA
540 Z1=YA:X=4:GOSUB580
550 Z1=MA:X=11:GOSUB580
560 PRINT TAB(16);USING"###,###.##";IA;:PRINTTAB(34);USING"###,###.##";PA;:PRINTTAB(50);USING"###,####.##";BA
570 RETURN
580 GOSUB600:PRINTTAB(X-K)LEFT$(Z1,K);:RETURN
590 REM COLUMNING
600 Z1$=STR$(Z1):K=LEN(Z1$):RETURN
610 X$=INKEY$:IFX$=""THENGOTO540ELSERETURN

```


For the Commodore PET and 64

```

10 REM MORTGAGE
20 REM DW CHANTRY
30 REM CONVERTED TO PET BY
40 REM LARRY ALLEN
50 REM C =COMPOUNDS/YEAR
60 REM IR=INTEREST RATE
70 REM IX=INTEREST FACTOR
80 REM P =PRINCIPLE
90 REM PY=PAYMENT
100 REM T =TIME
110 REM YA=CURRENT YEAR
120 REM MA=CURRENT MONTH
130 REM MAIN PROGRAM
140 PRINTCHR$(19)
145 PRINTCHR$(147)
150 REM SET UP HEADING
160 GOSUB460:GOSUB470
165 GOSUB470:GOSUB460
170 PRINT
180 PRINT:PRINT"PRINCIPLE";
185 INPUT"";P
190 PRINT:PRINT"RATE %P.A.";
195 INPUT"";IR
200 PRINT:PRINT"2 COMPOUNDINGS/YEAR? N/Y ";;C=2
210 GETX$:IFX$=""THEN210
220 IFX$<>"N"THENGOTO240
230 PRINT:INPUT"THEN HOW MANY COMPOUNDINGS/YEAR ?";C:GOTO250
240 PRINT
250 PRINT:PRINT"TIME-YEARS";:INPUT"";T
260 PRINTCHR$(147)
270 REM CALCULATE INTEREST FACTOR
280 IR=IR/100:GOSUB570
290 REM CALCULATE MONTHLY PAYMENT
300 GOSUB560
310 REM NOW FIX 2 DECIMAL PLACES
320 Z1=PY:GOSUB790:PY=Z1:PZ=Z2
330 PRINTCHR$(19)
340 REM CALCULATE MONTH BY MONTH
350 GOSUB590
360 PRINTCHR$(147):PRINT"DO ANOTHER MORTGAGE? Y/N";
370 GETX$:IFX$=""THEN370
380 IFX$="N"THENGOTO400
390 PRINTCHR$(147):GOTO140
400 PRINTCHR$(147)
410 PRINTCHR$(19):PRINT" ALLRIGHT THEN...";"GOOD-BYE":FORPA=1TO2000:NEXT
420 PRINTCHR$(19)
430 END
440 REM HEADING
450 PRINTCHR$(147)
460 FORX=1TO40:PRINT"*";:NEXTX:RETURN
470 PRINT"***";:PRINTSPC(36)"***";:RETURN
480 PRINT:PRINT"YEAR MONTH INTEREST PRINCIPLE BALANCE"
490 PRINT"-----"
500 RETURN
510 PRINT"PRINCIPLE $";P;TAB(23)" INT ";(INT(IX*1000000))/100
520 PRINTT;"YEARS @ ";IR*100;"% IS $";:Z1=PY:GOSUB790
530 PRINTLEFT$(Z1$,J+2);"PER MONTH"
540 RETURN
550 REM FORMULA
560 PY=(P*IX)/(1-(1+IX)^(-12*T)):RETURN
570 IX=((1+IR/C)^(C/12)-1):RETURN
580 REM MONTH BY MONTH
590 YA=0:MA=0:BA=P
600 FORYA=1TO(T):GOSUB610:NEXT:RETURN
610 GOSUB460:GOSUB510:GOSUB460:GOSUB480
620 FORMA=1TO12:GOSUB680:NEXT
630 PRINT"CONTINUE LISTING TO END OF ";T;"YEAR(S)?. Y/N";
640 GETX$:IFX$=""THEN640
650 IFX$="N"THEN360
660 PRINTCHR$(147)
670 REM MORTGAGE ARITHMETIC
680 IA=BA*IX:PA=PY-IA:BA=BA-PA
690 Z1=YA:X=4:GOSUB760
700 Z1=MA:X=9:GOSUB760
710 Z1=IA:X=18:GOSUB770
720 Z1=PA:X=26:GOSUB770
730 Z1=BA:X=37:GOSUB770
740 PRINT
750 RETURN
760 GOSUB830:PRINTTAB(X-(K)) LEFT$(Z1$,K);:RETURN
770 GOSUB790:PRINTTAB(X-(J)):PRINTLEFT$(Z1$,J+2);:RETURN
780 REM 2 DECIMAL POINTS
790 Z1$=STR$((Z1+.005):FORJ=1TOLEN(Z1$)
800 IFMID$(Z1$,J,1)<>"."THENNEXTJ
810 IFJ+2>=LEN(Z1$)THENZ1=Z1+.001:Z1$=STR$(Z1)
820 RETURN
830 Z1$=STR$(Z1):K=LEN(Z1$):RETURN

```

David Chantry, a member of TVOntario's technical team and an enthusiastic computer hobbyist has created the mortgage programs listed here.